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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/575,709	07/20/2000	Daniel P. Weitekamp	06618/488001/CIT/3024	5306

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FISH & RICHARDSON, PC  
4350 LA JOLLA VILLAGE DRIVE  
SUITE 500  
SAN DIEGO, CA 92122

EXAMINER

LYONS, MICHAEL A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 08/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/575,709

Applicant(s)

WEITEKAMP ET AL.

Examiner

Michael A. Lyons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-83 is/are pending in the application.
- 4a) Of the above claim(s) 1-4, 22-62 and 71-83 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63-70 is/are allowed.
- 6) ☒ Claim(s) 5-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 24
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of the invention of group II in Paper No. 6 is acknowledged.

Claims 1-4, 22-62, and 71-83 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected groups of inventions, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 6.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 5-12 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wach et al (5,953,477) in view of Payne et al (5,253,312).**

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Regarding claim 5, Wach (Fig. 61) discloses a fiber probe system 6100 with laser light 6101 entering an optical fiber 6103 having a first end optically coupled to the laser (not shown) and a second end tapered with a partially reflective surface to reflect light out of the fiber to measuring area 6150. The light reflects back off the measuring area into the fiber, generating interference with light inside the fiber, which is then detected at a photodetector not depicted in the figure. Wach fails to disclose the exact angle of the tapered fiber or a perpendicular light path out of the fiber after reflection.

Payne (Fig. 1A) discloses a fiber tip for use in a laser delivery system at the end of an optical fiber where the tip of the fiber is angled at 45 degrees (A1), causing the light to exit the fiber perpendicularly (A2) towards whatever surface or measuring area is external to the fiber. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the tip of Payne to the device of Wach in order to clarify the actual function and specifications of the second fiber end.

As for claim 6, the use of a not-flat fiber end is a matter of design choice.

As for claim 7, having multiple plans for light reflection is a matter of design choice.

As for claim 8, the end of the tip of Payne is polished and elliptical.

As for claim 9, the end of the tip of Payne is coated with light-reflecting material in order to reflect the light out of the fiber.

As for claims 10 and 11, Wach's fiber is optically coupled to the laser and the photodetector by merely receiving light from the laser and passing light to the photodetector.

As for claim 12, the spacing of the fiber and the measuring surface to create a maximum signal is well known in interferometry.

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As for claims 18-21, the modifications listed in the claims are all well known modifications and uses of optical fiber sensors in interferometry.

**Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wach et al (5,953,477) in view of Payne et al (5,253,312) and in further view of Hong et al (5,982,009).**

As for claims 13-15, the combination of Wach and Payne are disclosed above. However, this combination fails to disclose their use on a substrate with a mechanical oscillator such as a cantilever allowing movement of the fiber on the substrate. Hong discloses a device with a substrate 30 and a cantilever as a mechanical oscillator on the substrate that can be used with an optical fiber (Col. 8, lines 49-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the fiber of Wach and Payne onto a substrate with a cantilever as per Hong to facilitate movement of the fiber with regard to the measurand.

**Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wach et al (5,953,477) in view of Payne et al (5,253,312) and in further view of Doriath et al (4,516,073).**

As for claim 16, the combination of Wach and Payne are disclosed above. However, this combination fails to disclose their use within a magnetic system. Doriath discloses a device where an optical fiber is contained in a system containing static magnets 111 and 112 with the fiber between the gap in the magnets. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place the fiber of Wach and Payne in the

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magnetic field device of Doriath in order to locate the fiber and measurand in a static magnetic field for any desired measurements.

As for claim 17, the use of a moveable magnet in a system attached to a measuring surface is a matter of design choice.

***Allowable Subject Matter***

**Claims 63-70 are allowed in view of the prior art.**

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 63, the prior art of record, taken alone or in combination, fails to disclose or render obvious an evanescent sensing device, in combination with the rest of the limitations of claim 63.

The prior art of record, such as the article "Demonstration of an optimized evanescent field optical fibre sensor" by Z.M. Hale et al., discloses the fact that tapering an optical fiber to expose its evanescent field for use in sensing various specimens is well known in the art. The prior art, however, fails to show this evanescent field sensing used in the manner claimed, wherein the tapered fiber is used in sensing a measurand surface, the signal generated by which is then combined 180 degrees out of phase with light carried through the system by a reference fiber. This combined signal is then detected at a photodetector to determine the distance between the tapered fiber section and the measurand. The evanescent field sensing in the prior art is mainly used for absorption sensing using dye cells rather than a physical distance measurement as claimed.

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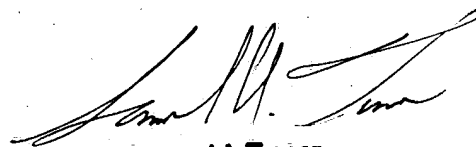
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 703-305-1933.

The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on 703-308-4877. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-0725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

MAL  
July 24, 2003



Samuel A. Turner  
Primary Examiner